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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
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EXAMINER
ARNOLD JR, JAMES

ART UNIT	PAPER NUMBER
1764	4

DATE MAILED: 05/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/001,485	Applicant(s) KELKAR ET AL.	
	Examiner James Arnold, Jr.	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) *22-29* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a)☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3,5* .
4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: .

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-21, drawn to a NOx removal composition, classified in class 502, subclass 304.

II. Claims 22-29, drawn to a NOx removal process, classified in class 208, subclass 113.

The inventions are distinct, each from the other because of the following reasons:

Inventions of Group I and Group II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the process as claimed can be practiced with another materially different product such as a composition not comprising a lanthanide series element.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Raymond Keller on May 8, 2003 a provisional election was made WITH traverse to prosecute the invention of Group 1, claims 1-21. Affirmation of this election must be made by applicant in replying to this Office action. Claims 22-29 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

Claim 14 is objected to because of the following informalities: The word "is" should be inserted between the first "oxide" and "praseodymium" in line 2 of the claim. Appropriate correction is required.

Claim 19 is objected to because of the following informalities: The letter "s" should be stricken from the word "components" in line 2 of the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-5 and 9-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peters et al. USPN 6,129,834) in view of Green et al. (USPN 4,973,399).

The Peters reference discloses a NO_X removal composition suitable for reducing NO_X emissions comprising an acidic oxide support, cerium oxide, and at least one oxide of a transition metal selected from Groups Ib and IIb of the Periodic Table including copper and silver. See Abstract. The reference discloses a composition wherein the acidic oxide support is either alumina or silica-alumina. See Column 2, lines 20-25. The reference discloses a composition wherein the alumina:silica mole ratio is from 3:1 to 50:1. See Column 2, lines 25-27. The reference discloses a composition wherein cerium oxide is present in amounts of at least one part per 100 parts per weight of acidic oxide support. See Column 6, lines 5-15. The reference discloses a fluid cracking catalyst composition comprising (a) a cracking component suitable for catalyzing the cracking of hydrocarbons and (b) a NOx reduction composition comprising (i) an acidic oxide support (ii) cerium oxide and (iii) an oxide of a transitional metal selected from Groups Ib and IIb of the Periodic Table, said NOx reduction composition being an integral component of the catalyst composition particles, being separate particles from the catalyst component or mixtures thereof and being present in the cracking catalyst in a sufficient NOx reducing amount. See Column 4, lines 1-30 and Column 6, lines 1-50. The reference discloses a cracking catalyst wherein said cracking catalyst comprises an admixture of component (a) and component (b); wherein said cracking catalyst comprises integral particles which contain both component (a) and component (b); and wherein the

NOx reduction composition (b) comprises about 0.1 to 15 wt% of the cracking catalyst composition. See Column 4, lines 1-30 and Column 6, lines 1-50.

The Peters reference does not disclose a composition comprising at least one oxide of a lanthanide series element other than cerium oxide. The reference does not disclose a composition wherein silica-alumina is prepared by caustic leaching of silica from calcined kaolin; from kaolin calcined through its characteristic exotherm; and wherein the caustic leached kaolin support is a microsphere whereby the caustic leached kaolin is bound with aluminum chlorohydroxide before calcinations through its characteristic exotherm. The reference does not explicitly disclose zinc as a constituent of the composition. The reference does not disclose the full range of cerium oxide present in amounts of from at least about 0.5 part by weight per 100 parts by weight of said acidic oxide support. The reference does not disclose a composition wherein at least one oxide of a lanthanide series element other than cerium oxide is present in amounts of at least about 0.5 part by weight per 100 parts by weight of said acidic oxide support nor amounts of from at least about 2 up to about 25 parts by weight per 100 parts by weight of said acidic oxide support. The reference does not disclose a composition wherein said oxide of a lanthanide series element other than cerium oxide is praseodymium oxide. The reference does not disclose a composition wherein the amount of ceria to praseodymium oxide ranges from about 1:4 to about 4:1 by weight or from about 1:2 to about 2:1 by weight. The reference does not disclose a fluid cracking catalyst composition comprising a cracking component suitable for catalyzing the cracking of hydrocarbons at least one oxide of a lanthanide series element other than ceria such as

praseodymium oxide. The reference does not disclose a composition where the full range alumina:silica mole ratio is from 1:1 to 50:1

The Green reference discloses a lanthanide series oxide other than cerium oxide such as praseodymium oxide. See Column 14, lines 50-68.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the composition of Peters to include a composition comprising at least one oxide of a lanthanide series element other than cerium oxide such as praseodymium oxide as disclosed by Green or to utilize a fluid cracking catalyst composition comprising a cracking component suitable for catalyzing the cracking of hydrocarbons at least one oxide of a lanthanide series element other than ceria such as praseodymium oxide because both the Green and Peters reference disclose compositions suitable for NOx reductions and ceria and praseodymium would be expected to display similar properties because both are lanthanide series elements. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize zinc as a constituent of the NOx reduction composition because the Peters reference discloses the use of Group I and Group IIb transition metals in said composition. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the full range of cerium oxide present in amounts of from at least about 0.5 part by weight per 100 parts by weight of said acidic oxide support; to utilize a composition wherein at least one oxide of a lanthanide series element other than cerium oxide is present in amounts of at least about 0.5 part by weight per 100 parts by weight of said acidic oxide support or amounts of from at least about 2 up to about 25 parts by weight per 100 parts by weight of said acidic oxide support; and to

utilize a composition wherein the amount of ceria to praseodymium oxide ranges from about 1:4 to about 4:1 by weight or from about 1:2 to about 2:1 by weight because the constituent components cerium oxide, praseodymium oxide, and lanthanide series oxides are disclosed by Peters and/or Green and it would be appropriate to adjust the ratios so that the composition will be effective for NOx removal. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the full range alumina:silica mole ratio of from 1:1 to 50:1 because an overlapping range is disclosed be Peters and it would be appropriate to adjust the range to utilize a composition effective for NOx removal.

Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peters et al. USPN 6,129,834) in view of Green et al. (USPN 4,973,399) as applied to claims 1-5 and 9-21 above, and further in view of Lussier (USPN 4,847,225).

The Lussier reference discloses a composition wherein the silica-alumina is prepared by caustic leaching of silica from calcined kaolin; a composition wherein the said silica-alumina is prepared by the caustic leaching of silica from kaolin calcined through its characteristic exotherm; and a composition where the caustic leached kaolin support is a microsphere whereby the caustic leached kaolin is bound with aluminum chlorohydroxide before calcinations through its characteristic exotherm. See Column 1, lines 25-35; Column 2, lines 24-35; Column 3, lines 1-25; and Column 5, lines 5-20.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the composition of Peters and Green to utilize a composition wherein the silica-alumina is prepared by caustic leaching of silica from calcined kaolin; a composition wherein the said silica-alumina is prepared by the caustic

leaching of silica from kaolin calcined through its characteristic exotherm; and a composition where the caustic leached kaolin support is a microsphere whereby the caustic leached kaolin is bound with aluminum chlorohydroxide before calcinations through its characteristic exotherm because all three references disclose catalysts capable of NOx removal in an FCC process and because the use of silica-alumina is disclosed by all three references and it would be appropriate to prepare silica-alumina in any way effective for NOx removal.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Arnold, Jr. whose telephone number is 703-305-5308. The examiner can normally be reached on Monday-Thursday 8:30 AM-6:00 PM; Fridays from 8:30 AM-5:00 PM with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.

Walter D. Griffin
Primary Examiner

ja
May 18, 2003